

# QM Series Photoelectric Sensors



2m Output



M8 Quick-Disconnect

## Mini-rectangular plastic - DC

- 56 models available
- Rectangular photoelectric sensor (photo eye)
- Plastic housing
- Selectable Light-on/Dark-on output
- Diffuse, diffuse with background suppression, polarized retroreflective, retroreflective for clear objects, through-beam, and retroreflective models
- 3-wire NPN or PNP
- Easy-to-use potentiometer for setting switchpoint distance on select models
- Through-beam models include emitter and receiver pair
- 2m output cable or M8 quick-disconnect. Purchase cable separately
- IP67 rated
- Mounting brackets and shutter accessories available



QM Series Photoelectric Sensors (Diffuse)							
Part Number	Price	Sensing Distance	Emission Type	Logic	Connection	Wiring	Characteristic Curves
<a href="#">QMRB-0N-0A</a>		5 – 100 mm (0.2 – 3.94 in)	Visible Red 630nm	NPN	2-meter cable	Diagram 1	QMRBx
<a href="#">QMRB-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMRB-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMRB-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	
<a href="#">QMR7-0N-0A</a>		0 – 400 mm (0 – 15.75 in)	Visible Red 630nm	NPN	2-meter cable	Diagram 1	QMR7x
<a href="#">QMR7-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMR7-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMR7-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	
<a href="#">QMI7-0N-0A</a>			Infrared 850nm	NPN	2-meter cable	Diagram 1	QMI7x
<a href="#">QMI7-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMI7-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMI7-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	
<a href="#">QMR8-0N-0A</a>		0 – 1 m (0 – 3.28 ft)	Visible Red 630nm	NPN	2-meter cable	Diagram 1	QMR8x
<a href="#">QMR8-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMR8-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMR8-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	
<a href="#">QMI9-0N-0A</a>		0 – 1.5 m (0 – 4.9 ft)	Infrared 850nm	NPN	2-meter cable	Diagram 1	QMI9x
<a href="#">QMI9-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMI9-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMI9-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	

# QM Series Photoelectric Sensors

QM Series Photoelectric Sensors (Diffuse with Background Suppression)							
Part Number	Price	Sensing Distance	Emission Type	Logic	Connection	Wiring	Characteristic Curves
<a href="#">QMRS-0N-0A</a>		30 – 200 mm (1.2 – 7.87 in)	Visible Red 630nm	NPN	2-meter cable	Diagram 1	QMRSx
<a href="#">QMRS-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMRS-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMRS-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	
<a href="#">QMIS-0N-0A</a>		30 – 400 mm (1.2 – 15.75 in)	Infrared 850nm	NPN	2-meter cable	Diagram 1	QMISx
<a href="#">QMIS-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMIS-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMIS-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	

QM Series Photoelectric Sensors (Retroreflective)							
Part Number	Price	Sensing Distance	Emission Type	Logic	Connection	Wiring	Characteristic Curves
<a href="#">QMIC-0N-0A</a>		0.1 – 7 m (0.32 – 22.96 ft)	Infrared 850nm	NPN	2-meter cable	Diagram 1	QMICx
<a href="#">QMIC-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMIC-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMIC-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	

Note: Purchase reflectors separately.

QM Series Photoelectric Sensors (Polarized Retroreflective)							
Part Number	Price	Sensing Distance	Emission Type	Logic	Connection	Wiring	Characteristic Curves
<a href="#">QMRN-0N-0A</a>		0.1 – 5 m (0.32 – 16.4 ft)	Visible Red 630nm	NPN	2-meter cable	Diagram 1	QMRNx
<a href="#">QMRN-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMRN-0P-0A</a>				PNP	2-meter cable	Diagram 2	
<a href="#">QMRN-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2	

Note: Purchase reflectors separately.

QM Series Photoelectric Sensors (Retroreflective for Transparent Objects)								
Part Number	Price	Sensing Distance	Emission Type	Logic	Connection	Wiring	Characteristic Curves	
<a href="#">QMRL-0N-0A</a>		0.4 – 4 m (1.31 – 13.12 ft)	Visible Red 630nm	NPN	2-meter cable	Diagram 1	QMRLx	
<a href="#">QMRL-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1		
<a href="#">QMRL-0P-0A</a>				PNP	2-meter cable	Diagram 2		
<a href="#">QMRL-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2		
<a href="#">QMRG-0N-0A</a>		0.05 – 1.5 m (0.16 – 4.9 ft)		Infrared 850nm	NPN	2-meter cable	Diagram 1	QMRGx
<a href="#">QMRG-0N-0F</a>					NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMRG-0P-0A</a>					PNP	2-meter cable	Diagram 2	
<a href="#">QMRG-0P-0F</a>					PNP	4-pin M8 quick-disconnect	Diagram 2	
<a href="#">QMIG-0N-0A</a>		0.05 – 1 m (0.16 – 3.28 ft)	Infrared 850nm		NPN	2-meter cable	Diagram 1	QMIGx
<a href="#">QMIG-0N-0F</a>					NPN	4-pin M8 quick-disconnect	Diagram 1	
<a href="#">QMIG-0P-0A</a>					PNP	2-meter cable	Diagram 2	
<a href="#">QMIG-0P-0F</a>					PNP	4-pin M8 quick-disconnect	Diagram 2	

Note: Purchase reflectors separately.

# QM Series Photoelectric Sensors

QM Series Photoelectric Sensors (Through-beam)							
Part Number	Price	Sensing Distance	Emission Type	Logic	Connection	Wiring	Characteristic Curves
<a href="#">QMRHD-0N-0A</a>		0.0 – 20 m (0 – 65.62 ft)	Visible Red 630nm	NPN	2-meter cable	Diagram 1/3	QMRHDx
<a href="#">QMRHD-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1/3	
<a href="#">QMRHD-0P-0A</a>				PNP	2-meter cable	Diagram 2/3	
<a href="#">QMRHD-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2/3	
<a href="#">QMIHD-0N-0A</a>		0.0 – 30 m (0 – 98.43 ft)	Infrared 850nm	NPN	2-meter cable	Diagram 1/3	QMIHDx
<a href="#">QMIHD-0N-0F</a>				NPN	4-pin M8 quick-disconnect	Diagram 1/3	
<a href="#">QMIHD-0P-0A</a>				PNP	2-meter cable	Diagram 2/3	
<a href="#">QMIHD-0P-0F</a>				PNP	4-pin M8 quick-disconnect	Diagram 2/3	

Note: Through-beam models include emitter and receiver pair.

Switching Element Function		
	Through-Beam and Reflective Models	Diffuse Models
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

## Wiring Diagrams

Diagram 1  
NPN Output

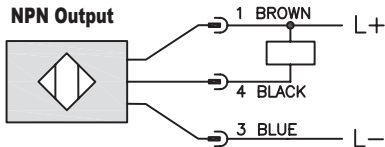


Diagram 2  
PNP Output

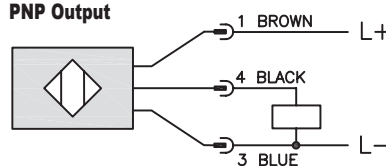
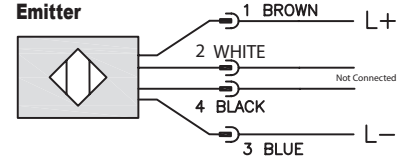
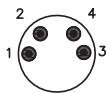


Diagram 3  
Emitter

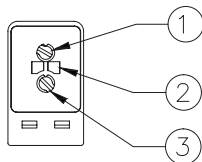


### Connector

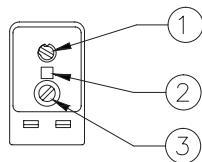
M8 Connector



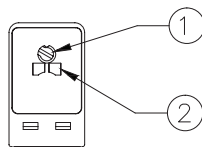
## LED Indicators and Adjustments



Diffuse, Retro-Reflective, Polarized Retroreflective, Retroreflective for Transparent Objects



Diffuse with Background Suppression



Through-Beam

- 1: Output Adjustment (Light On/Dark On)
- 2: Status LED(s)
- 3: Sensing Adjustment

# QM Series Photoelectric Sensors

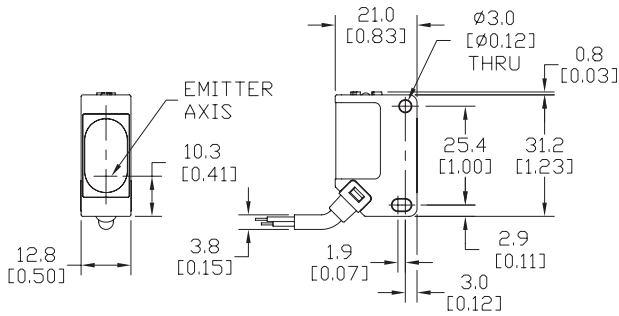
QM Series Photoelectric Sensors Specifications					
Type	Diffuse	Background suppression	Retroreflective for transparent objects	Polarized Retroreflective	Retroreflective Through-beam
<b>Sensing Distance</b>	Refer to QM Series in the Photoelectric Sensors Selection Guide				
<b>Light Spot Diameter</b>	Refer to Characteristic Curves				
<b>Emission</b>	Refer to QM Series in the Photoelectric Sensors Selection Guide				
<b>Sensitivity</b>	Adjustable (270°)	Adjustable (4 turns)	Adjustable (270°)		
<b>Output Type</b>	Light-on or Dark-on				
<b>Operating Voltage</b>	10 – 30 VDC				
<b>No Load Supply Current</b>	Visible Red: 30mA, Infrared: 45mA				
<b>Operating (Load) Current</b>	≤ 100mA				
<b>Off-state (Leakage) Current</b>	≤ 10uA				
<b>Voltage Drop</b>	2V max @ 100mA				
<b>Switching Frequency</b>	QMRBx, QMR8, QMI9 (1kHz) QMRx7 (2kHz)	1kHz	2kHz		
<b>Ripple</b>	≤ 10%				
<b>Time Delay Before Availability (tv)</b>	≤ 100ms				
<b>Repeatability</b>	5%				
<b>Short-Circuit Protection</b>	Short circuit (auto reset), over voltage pulses				
<b>Operating Temperature</b>	-25 to 70 °C (-13 to 158 °F)				
<b>Thermal Drift</b>	-30 to 80 °C (-22 to 176 °F)				
<b>Protection Degree (DIN 40050)</b>	IP67 (EN60529)				
<b>LED Indicators - Light On/Dark On</b>	Yellow				
<b>LED Indicators - Excess Gain</b>	Green	–	Green		
<b>Housing Material</b>	PA66				
<b>Lens Material</b>	Polymethyl methacrylate (PMMA)				
<b>Shock/Vibration</b>	See <a href="#">terminology section</a>				
<b>Tightening Torque</b>	1Nm				
<b>Weight</b>	M8: 10g [.35 oz]; Cable: 52g [1.83 oz]				
<b>Connectors</b>	Refer to QM Series in the Photoelectric Sensors Selection Guide				
<b>Accessories</b>	–	–	–		
<b>Agency Approvals</b>	CE, cULus E187310				

# QM Series Photoelectric Sensors

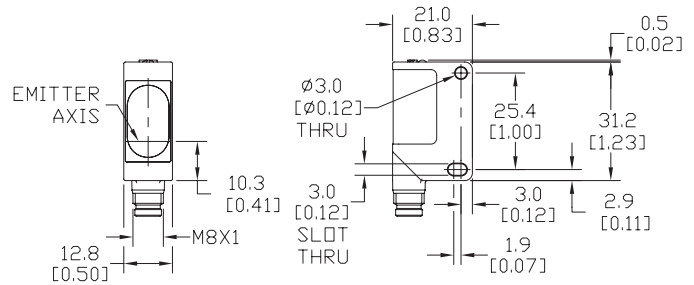
## Dimensions

mm [inches]

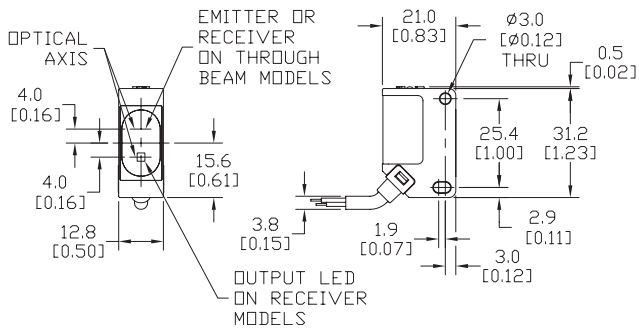
**QM\*S Background Suppression Model - 2m Output**



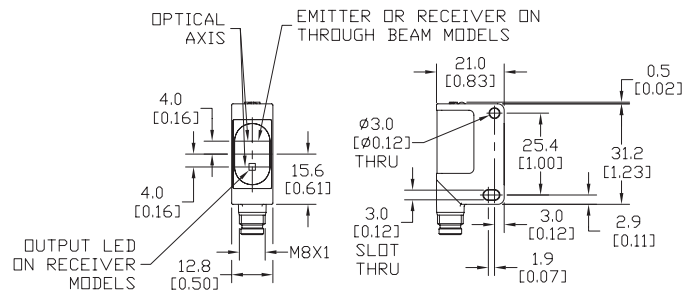
**QM\*S Background Suppression Model - M8 Quick Disconnect**



**All Other QM Series - 2m Output**



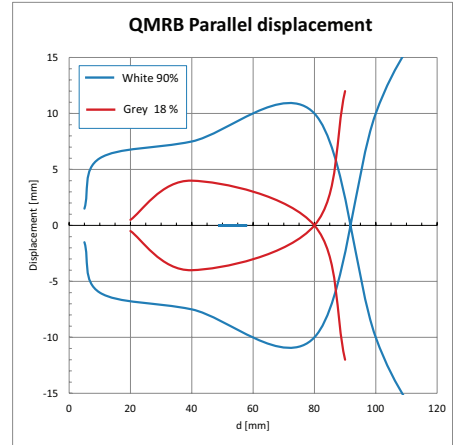
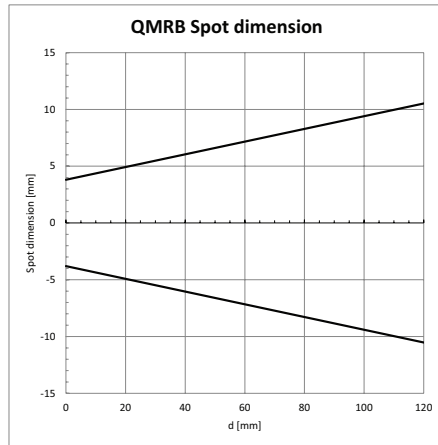
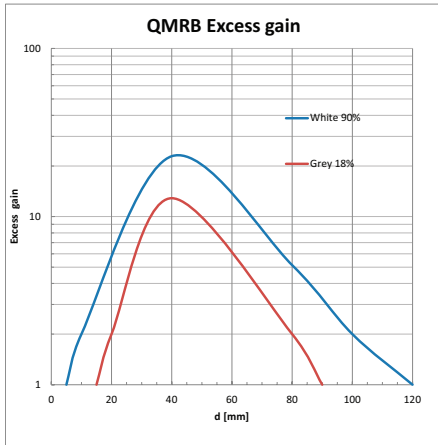
**All Other QM Series - M8 Quick-Disconnect**



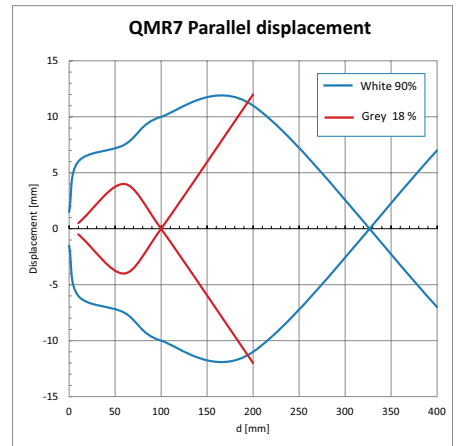
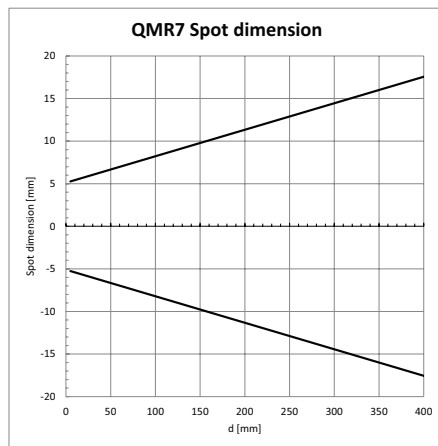
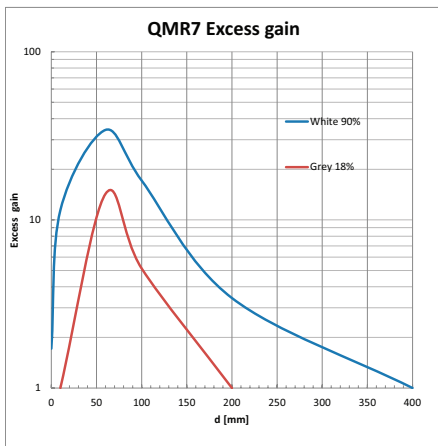
# QM Series Photoelectric Sensors

## Characteristic Curves

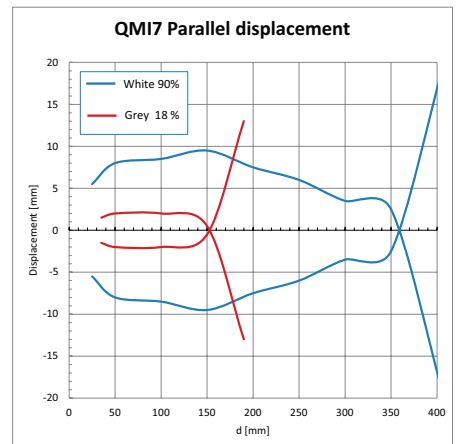
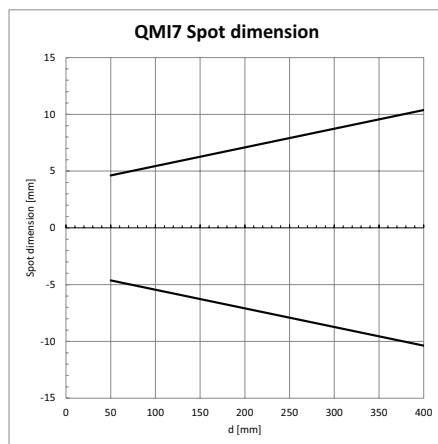
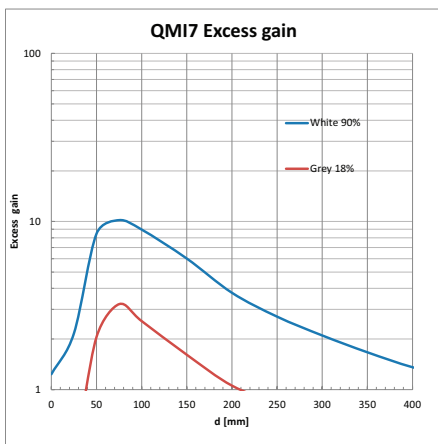
### QMRBx



### QMR7x



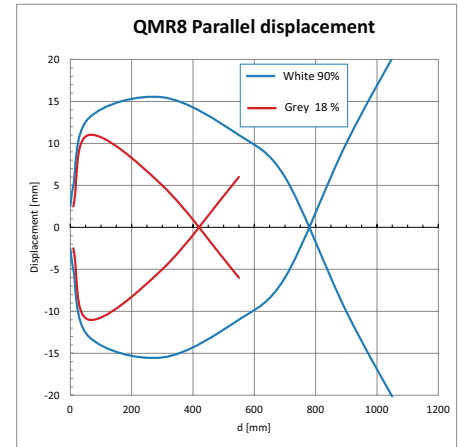
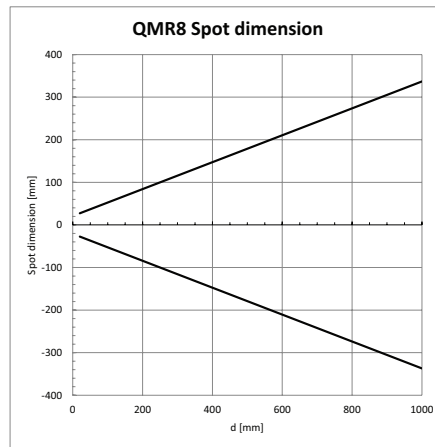
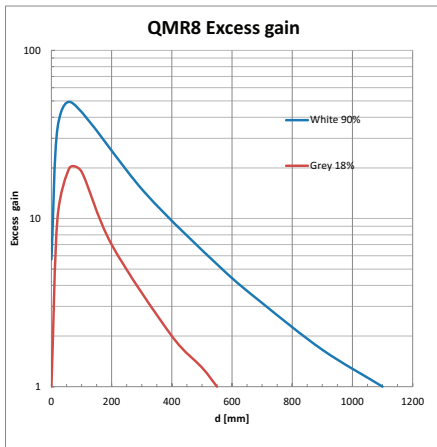
### QMI7x



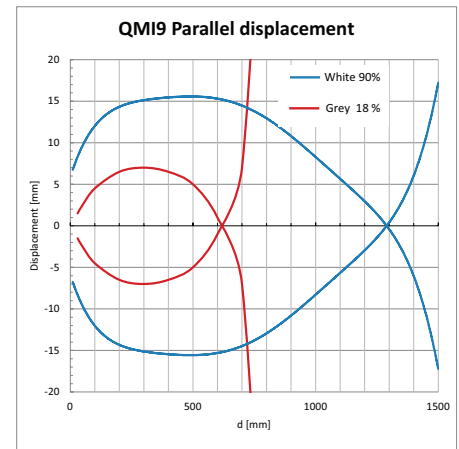
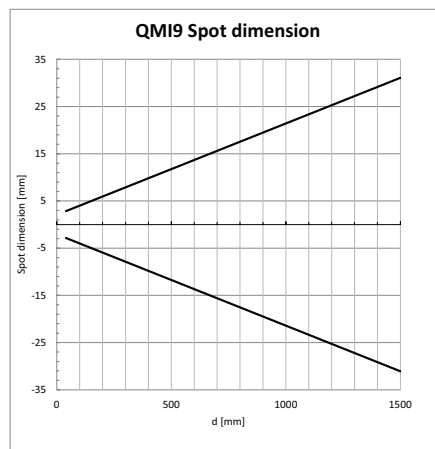
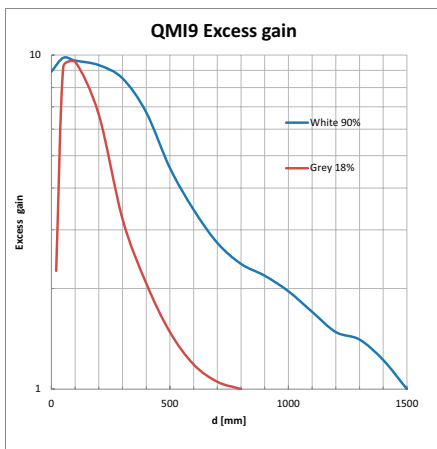
# QM Series Photoelectric Sensors

## Characteristic Curves

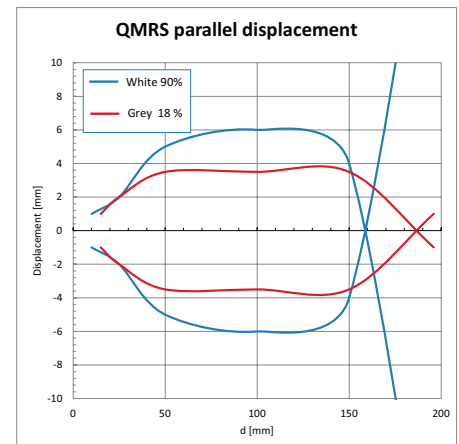
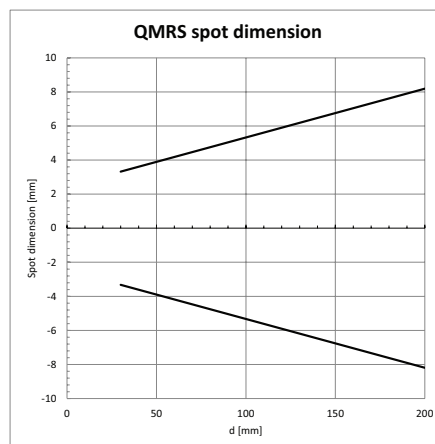
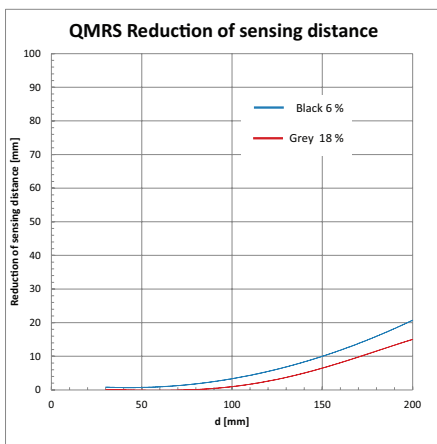
### QMR8x



### QMI9x



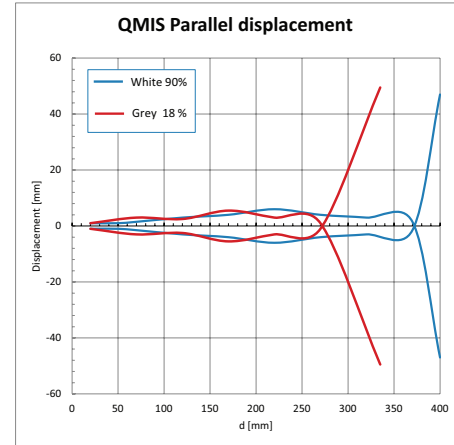
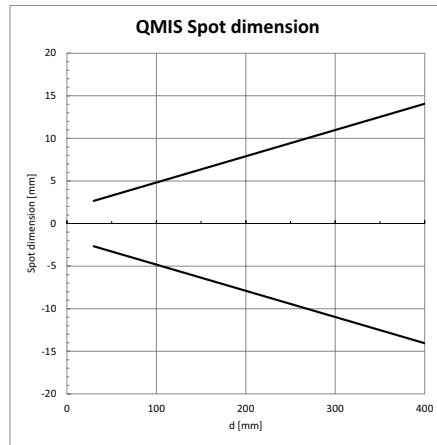
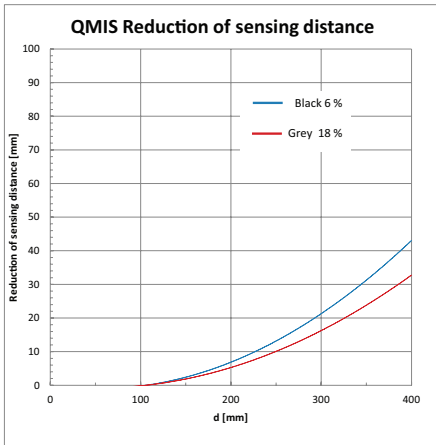
### QMRSx



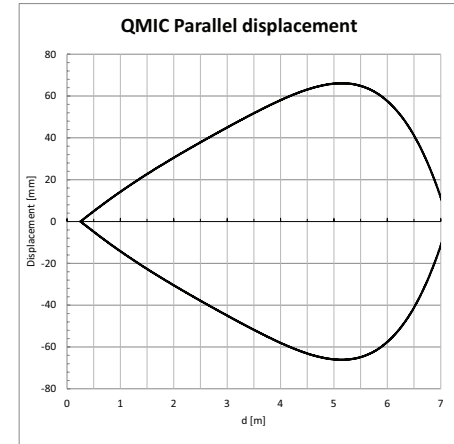
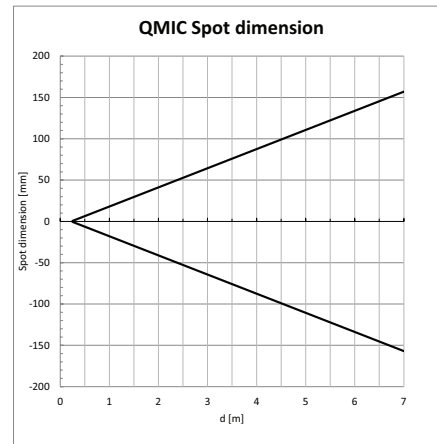
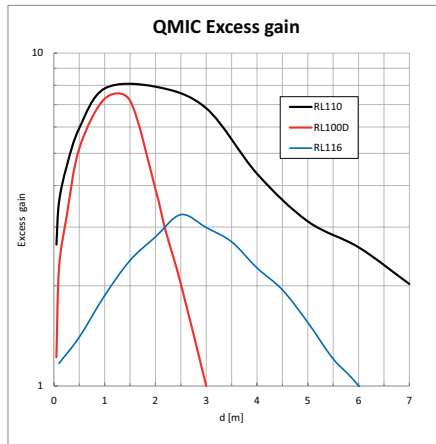
# QM Series Photoelectric Sensors

## Characteristic Curves

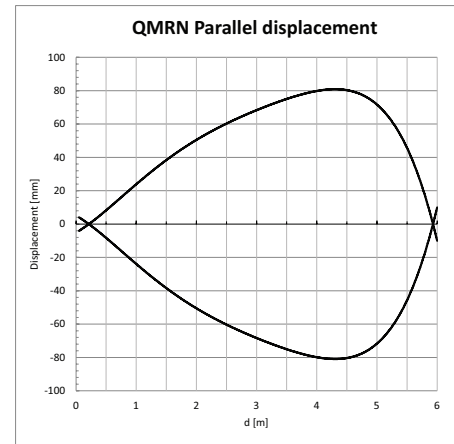
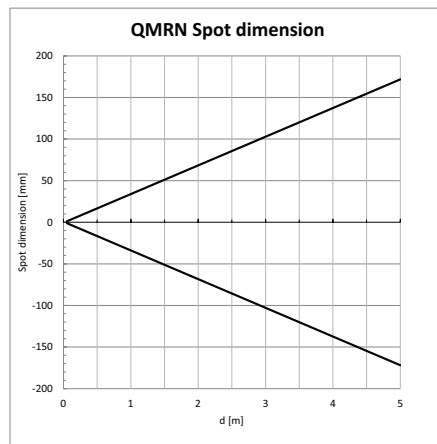
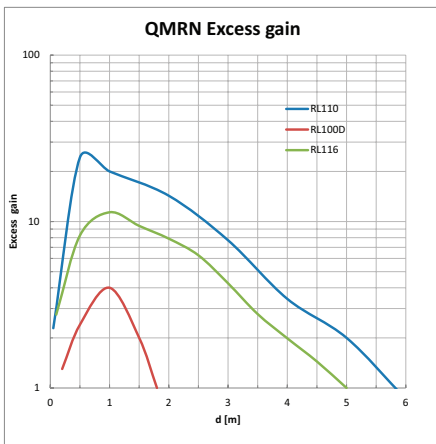
### QMISx



### QMICx



### QMRNx

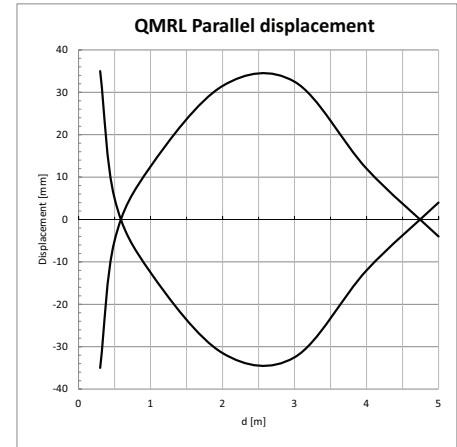
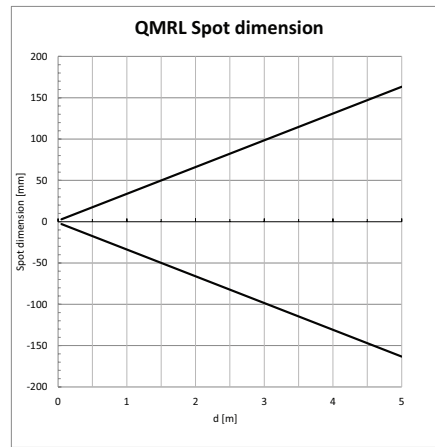
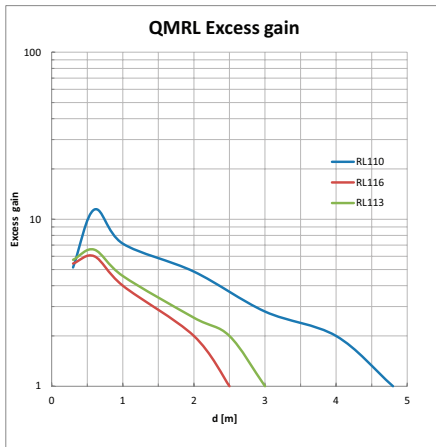




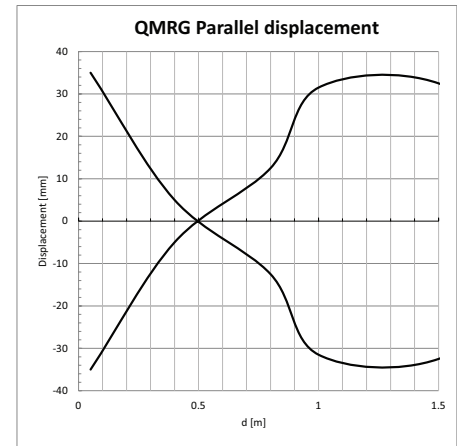
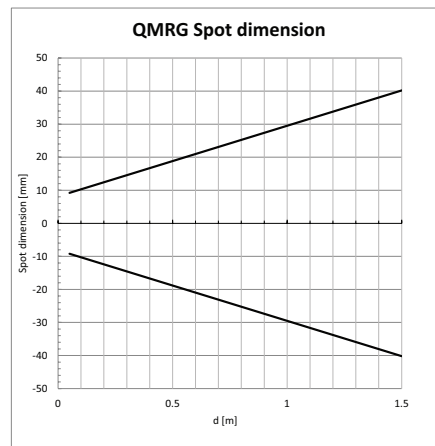
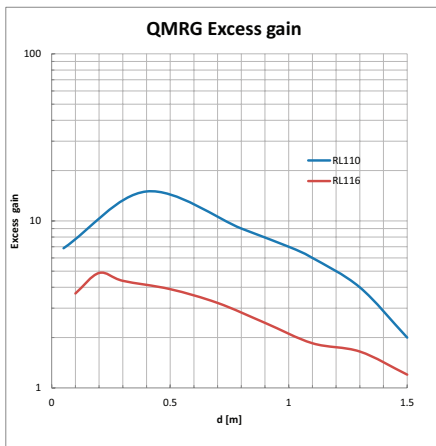
# QM Series Photoelectric Sensors

## Characteristic Curves

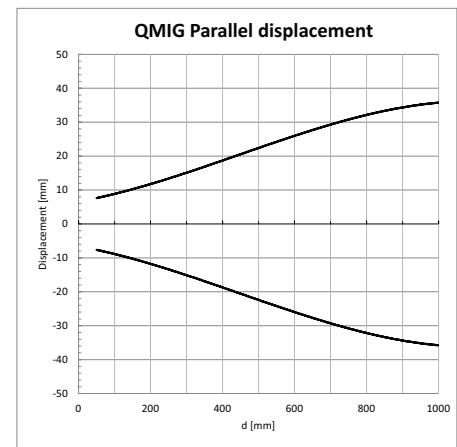
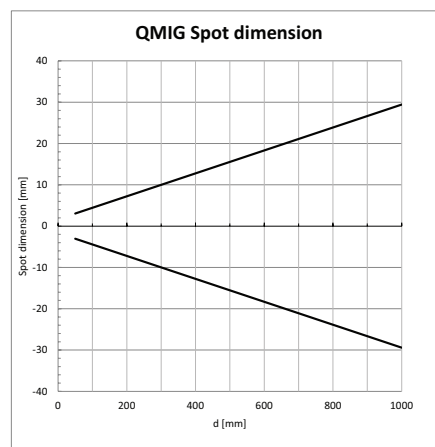
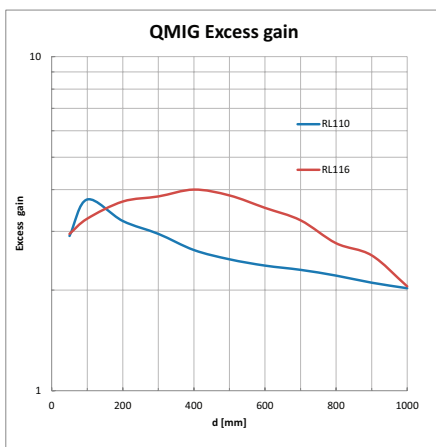
### QMRLx



### QMRGx



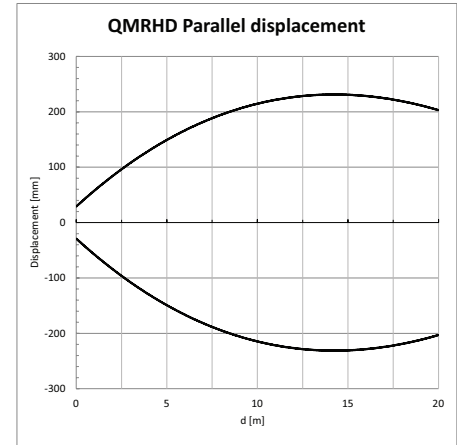
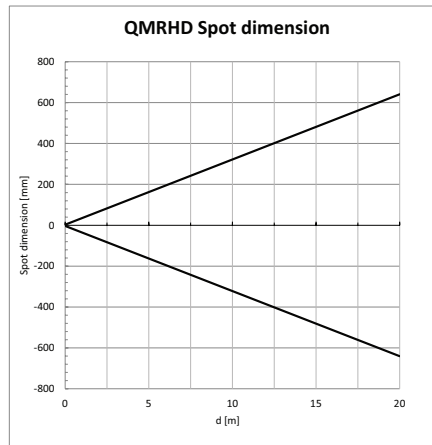
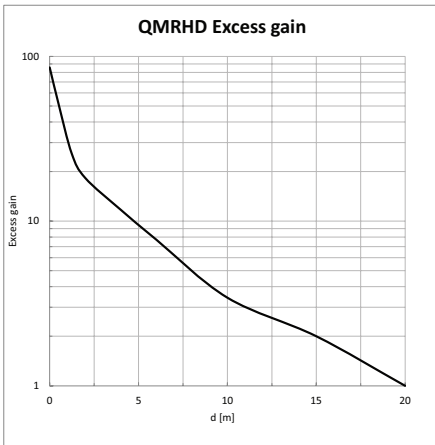
### QMIGx



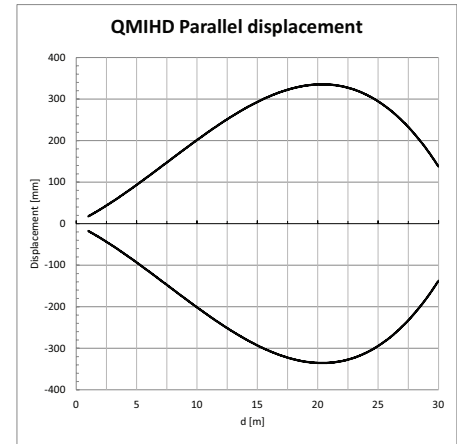
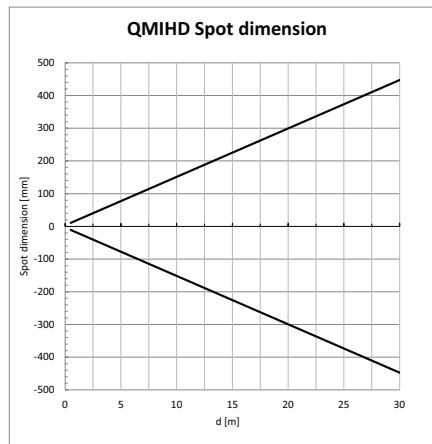
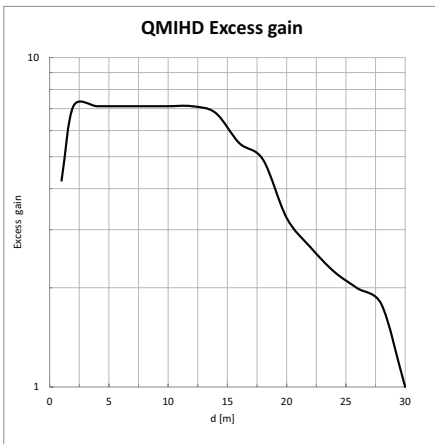
# QM Series Photoelectric Sensors

## Characteristic Curves

### QMRHDx



### QMIHDx

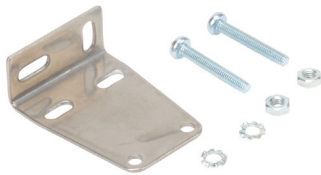


# Accessories for QM and FM Series Photoelectric Sensors

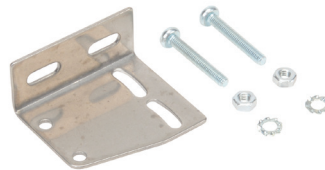
## Right-angle Mounting Brackets

Mounting bracket, right-angle vertical, 304 stainless steel. For use with QM & FM series photoelectric sensors. Mounting hardware included.

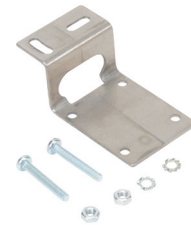
Accessories for QM and FM Series Photoelectric Sensors				
Part Number	Price	Description	Drawing Link	Weight [lb]
<a href="#"><u>ST101</u></a>		Micro Detectors mounting bracket, right-angle vertical, 304 stainless steel. For use with QM & FM series photoelectric sensors. Mounting hardware included.	<a href="#">PDF</a>	0.04
<a href="#"><u>ST102</u></a>		Micro Detectors mounting bracket, right-angle horizontal, 304 stainless steel. For use with QM & FM series photoelectric sensors. Mounting hardware included.	<a href="#">PDF</a>	0.05
<a href="#"><u>ST104</u></a>		Micro Detectors mounting bracket, protective horizontal, 304 stainless steel. For use with prewired QM & FM series photoelectric sensors only. Mounting hardware included.	<a href="#">PDF</a>	0.05



ST101



ST102



ST104

# Accessories for QM Series Photoelectric Sensors

## Mounting Bracket

Mounting bracket, protective vertical, 304 stainless steel. For use with prewired QM series photoelectric sensors only. Mounting hardware included.

Accessories for QM Series Photoelectric Sensor				
Part Number	Price	Description	Drawing Link	Weight [lb]
<a href="#">ST103</a>		Micro Detectors mounting bracket, protective vertical, 304 stainless steel. For use with prewired QM series photoelectric sensors only. Mounting hardware included.	<a href="#">PDF</a>	0.06

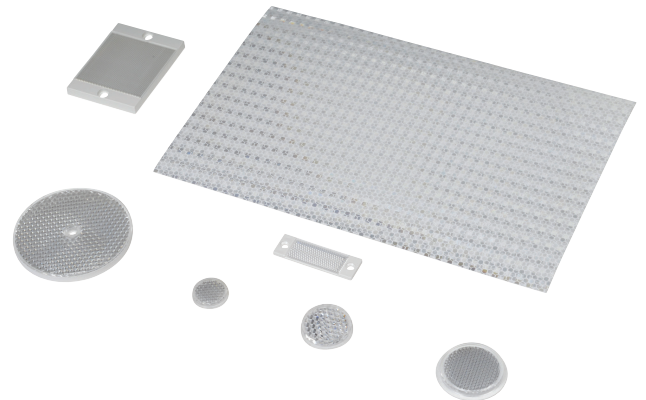


**ST103**

# Reflectors

## RL Series Reflectors for Polarized Reflective Photoelectric Sensors (All Models)

- Suitable for use with polarized light photoelectric sensors
- Shapes and sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- Single hole, dual hole and self-adhesive mounting types available
- Single and 10-packs available



## Installation Notes

- Keep the reflector surface clean to ensure peak detection performance. This is especially true when the maximum sensing range is being used. Clean using a damp cloth.
- When selecting a reflector, it is important to consider the ambient conditions it will be exposed to. Dusty or high humidity conditions may reduce the sensing range as much as 90%.
- Reflectors should be positioned at a 90° angle to the optical axis with a tolerance of ±15°.

Reflector Specifications							
Part number	Price	Drawing Link	Quantity	Dimensions mm [in]	Degree of Protection	Mounting	Materials
RL102		<a href="#">PDF</a>	10	25	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic)  Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1			1	[0.98]			
RL103		<a href="#">PDF</a>	10	34.5			
RL103-1			1	[1.36]			
RL104		<a href="#">PDF</a>	10	46			
RL104-1			1	[1.81]			
RL105G		<a href="#">PDF</a>	10	95 x 38		Two 4.3 mm holes	
RL105G-1			1	[3.74 x 1.50]			
RL106G		<a href="#">PDF</a>	10	182 x 42		Two 6mm holes	
RL106G-1			1	[7.17 x 1.65]			
RL110		<a href="#">PDF</a>	10	84		One 5mm hole	
RL110-1			1	[3.31]			
RL116		<a href="#">PDF</a>	10	41 x 60		Two 3mm holes	
RL116-1			1	[3.54 x 2.36]			
RL100DA4		NA	1	200 x 300		Self-adhesive	
RL100DC4		NA	1	50 x 300			
RL100DQ1		NA	1	100 x 100			
RL111G		<a href="#">PDF</a>	10	22.5 x 47	Two 3mm slots	Reflective face: PMMA Polymethylmethacrylate (acrylic)  Base material: ABS (Acrylonitrile-butadiene-styren)	
RL111G-1			1	[0.89 x 1.85]			
RL112G		<a href="#">PDF</a>	10	19 x 73			
RL112G-1			1	[0.75 x 2.87]			
RL113G		<a href="#">PDF</a>	10	51.4 x 60.3			Two 4mm slots
RL113G-1			1	[2.02 x 2.37]			

Not recommended for applications involving moist air environments or water immersion.

# Reflectors

## RL Series Reflectors for Polarized Reflective Laser Photoelectric Sensors (FALN series)

- Suitable for use with polarized light laser photoelectric sensors
- Sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- Single and 5-packs available

Specifications						
Part Number	RL201	RL201-1	RL203	RL203-1	RL204	RL204-1
Price						
Drawing Link	<a href="#">PDF</a>		<a href="#">PDF</a>		<a href="#">PDF</a>	
Quantity	5	1	5	1	5	1
Dimensions	60 x 82 mm 2.36 x 3.23 in		19 x 6mm 0.75 x 2.36 in		20mm x 32mm 0.80 in x 1.26 in	
Degree of Protection <sup>1</sup>	IEC IP67					
Mounting	Two 0.4 mm holes		Two 0.4 mm holes		Two 0.3 mm holes	
Materials	Acrylic/polycarbonate					

<sup>1</sup> Not recommended for applications involving moist air environments or water immersion.

# Shutters and Adapters

## Shutters for M18 (18mm) Through-beam Sensors (SSE / SSR)

- Reduces the emitted beam, allowing the detection of small targets
- Shutter consists of an aluminum cap and aperture with an O-ring and glass lens, which can screw onto the optical head of either the emitter or receiver

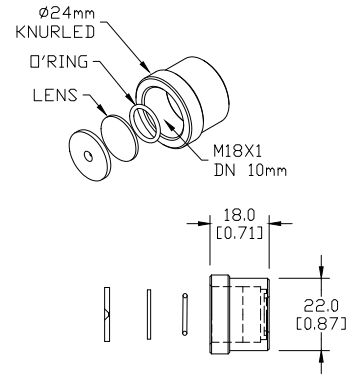
Sensing Distance (When Used with SSE / SSR Model Photoelectric Switches)						
Model	ST0S1	ST0S2	ST0S3	ST0S4	ST0S6	ST0S8
Price						
Ø x shutter (mm)	1	2	3	4	6	8
Distance (m) Object (mm)	N/A	N/A	N/A	1.5 2	3.5 3	6.5 4

Table shows sensing distance and minimal detectable object.



ST0S1-ST0S8

Dimensions  
mm [inches]



Shutter Accessory for QM Series Sensors				
Part Number	Price	Drawing Link	Description	Weight [lb]
<a href="#">STQMO</a>		<a href="#">PDF</a>	Micro Detectors shutter, plastic. Package of 2. For use with through beam QM series photoelectric sensors. Vertical and horizontal diaphragms (0.5, 1, 2mm) included.	0.1

Shutter (STQMO) Sensing Distances			
Shutter Size	0.5 mm	1mm	2mm
Maximum Sensing Distance	1.5 m	2 m	4.5 m
Minimum Detectable Object Diameter	0.8 mm	1.5 mm	2.5 mm

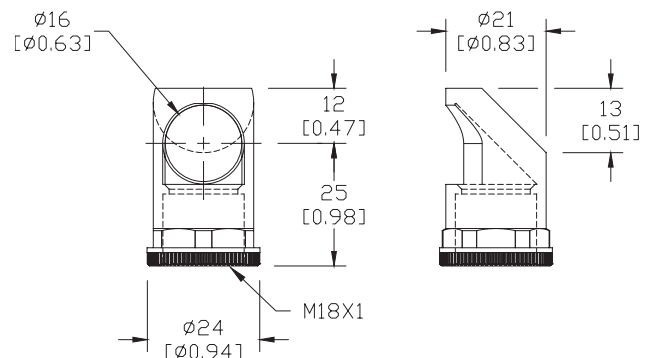
Note: With shutters on emitter and receiver in same vertical or horizontal orientation.

## Right-angle M18 (18 mm) Beam Adapter

For use with M18 retroreflective and through-beam photoelectric switches (not for use with diffuse reflection sensors). Allows 90° light detection using an internal mirror set at 45° to the optical axis. Sensitivity loss is about 20-30%.

Beam Adapters			
Part Number	Price	Description	Weight [lb]
<a href="#">ST03</a>		Right-angle beam adapter, for use with 18mm sensors (except diffuse reflection models), mirror allows 90 degree light detection.	0.06

Dimensions  
mm [inches]



ST03